A. FREIER.

WIRE CONNECTOR.

APPLICATION FILED JAN. 18, 1909.

980,770. Patented Jan. 3, 1911.

Fig. 1.

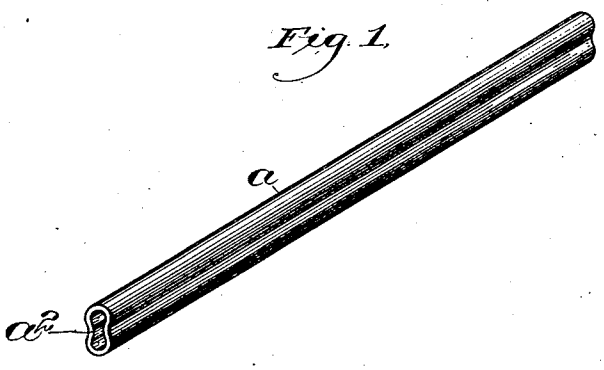


Fig. 2.

Fig. 3.

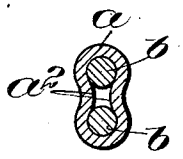


Fig. 4.

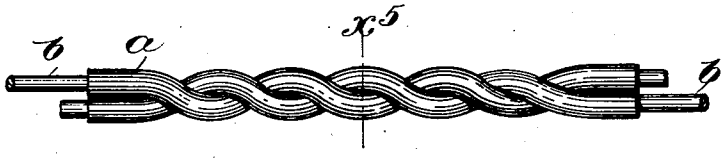
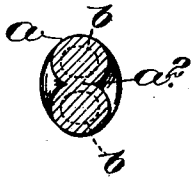


Fig. 5.



Witnesses:

Jas. J. Maloney.

Inventor:

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UNITED STATES PATENT OFFICE.

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WIRE-CONNECTOR.

980,770. Specification of Letters Patent. Patented Jan. 3, 1911.

Application filed January 18, 1909. Serial No. 472,909.

To all whom it may concern:

Be it known that I, ANTON FREIER, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Wire-Connectors, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to a wire connector, and is embodied in a connector of that class which is used to splice telegraph or telephone wires or other electric conductors. In connecting such wires, it is customary to use a connector in the form of a sleeve or enveloping member, which, when first placed in position, holds the ends of the wires parallel to each other, but loosely joined so that the wires can be easily placed in position. The close molecular union necessary for perfect conductivity, as well as the mechanical union necessary to give tensile strength and prevent the wires from pulling apart longitudinally is then attained by twisting the connector and the wires contained therein. In order to obtain the best possible union, it is necessary that the wires and the connector, when twisted together, should unite throughout, so as to form a substantially integral mass with the surfaces of the originally separate parts uniformly drawn into perfect contact to this end, it is necessary to shape the sleeve in such a form that it will approximately fit the two wires, before they are twisted, and then flow uniformly around them in the twisting operation.

In order to obtain the desired result, the metal of which the connector is made should be of a substantially uniform quality and thickness throughout, and should be shaped so that in the twisting operation the material of which the sleeve is made will form a coating for each wire substantially uniform in thickness on all sides of the wire, the coatings where the wires lie adjacent to each other after having been twisted being welded together, so to speak, so that wires and coating become practically one homogeneous piece of metal. These results cannot be obtained with connectors formed of flat blanks having the edges brazed, or otherwise connected, since this structure prevents the uniformity of flow of the metal, nor is it possible to obtain the desired result if the connector is so shaped that the wires lie in contact with each other—in the latter case it being impossible for the metal of which the sleeve is formed to flow around each wire.

I have found that by using a seamless tube of conducting material, preferably soft copper of uniform thickness throughout, so shaped as to have an inwardly projecting part extending far enough between the wires to separate them, but not meeting the opposite wall of the tube, I can make a substantially perfect joint. The pockets which are formed by the inwardly projecting part are of such diameter as to conform to the diameter of the wires which are to be connected, and the wires when placed in the pockets are separated a distance approximately equal to twice the thickness of the wall of the sleeve. At the same time the walls of the sleeve are separated from each other by substantially the same distance, the result being that when the sleeve and wires are twisted, the material of the sleeve is drawn in between the wires, there being just enough of the sleeve material to fill the space between the wires and form a homogeneous mass of substantially uniform density throughout.

Figure 1 is a perspective view of a connector embodying the invention; Fig. 2 is a cross section of the same enlarged; Fig. 3 is a similar view with the wires inserted; Fig. 4 is a side elevation of a finished joint; Fig. 5 is a cross-section, on line x^5 of Fig. 4, of the finished joint (enlarged), showing, by dotted lines, approximately the position of the wires.

The connector a consists of a cold drawn, seamless tube, made from a blank of uniform thickness, and subsequently shaped to form an inward projection a^2, extending far enough to separate the wires, but not far enough to meet the opposite wall. I prefer to use a shape approximating a figure **8** in cross-section, as shown in Fig. 2. By forming the tube in this way, the thickness of the wall of the tube is substantially uniform throughout, and no foreign substances are introduced as is the case when the sleeve is formed from a flat blank with the edges brazed or otherwise connected. As shown

in Fig. 2, the space left between the projections a^2 along the opposite inner walls of the tube is sufficient to keep the wires from contact with each other, and the proportions are such that the wires b, when inserted as shown in Fig. 3, are separated from each other a distance approximately equal to twice the distance of the wall of the tube.

When the wires and the connector are twisted so that they are brought from the position indicated by Fig. 3 to the position indicated by Fig. 4, the two wires are reversed in position, and each one is turned half around on its own axis, while the sleeve is stretched and distorted, the internally projecting portions a^2 being drawn in around the wires and forced together between them, as shown in Fig. 5. By shaping the sleeve, as shown, the amount of metal which is caused to flow between the wires by this distortion substantially fills the space between the two and the wires and the connector become substantially a solid mass, as shown in Fig. 5, thus insuring perfect electrical connection throughout. The film of metal surrounding each wire is of substantially uniform thickness throughout, and no spaces are left owing to any difference in the quality of the material. By making the sleeve in one seamless piece of cold drawn tubing, the flowage due to the distortion is uniform throughout, and there is no possibility of breakage or imperfect contact.

Claims.

1. A wire connector consisting of a seamless drawn tube of conducting material of uniform thickness and so shaped in cross section as to form internally projecting parts at opposite sides lying between the wires, the distance between said projecting parts being greater than the thickness of the wall of the tube, leaving a space sufficient to receive the displaced metal and form a uniform coating around each wire, substantially as described.

2. A wire connector consisting of a seamless drawn tube of conducting material shaped in cross section approximately like a figure **8**, with the internal projections at opposite sides extending inward far enough to keep the contained wires from contact with each other, but being separated from each other by a space sufficient to receive the metal displaced when the connector is twisted with the wires therein, substantially as described.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

ANTON FREIER.

Witnesses:

JAS. J. MALONEY,

M. E. COVENEY.